



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/568,461	02/15/2006	Yasuo Kobayashi	33082M300	1005
441 7590 10/06/2008 SMITH, GAMBRELL & RUSSELL 1130 CONNECTICUT AVENUE, N.W., SUITE 1130 WASHINGTON, DC 20036			EXAMINER PATEL, REEMA	
			ART UNIT 2812	PAPER NUMBER
			MAIL DATE 10/06/2008	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/568,461

Applicant(s)

KOBAYASHI ET AL.

Examiner

REEMA PATEL

Art Unit

2812

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 June 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7, 9-12 and 14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 3-5 is/are allowed.
- 6) ☒ Claim(s) 1, 2, 6, 7, 9-12 and 14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 February 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB08)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Paper No(s)/Mail Date _____
- 6) ☐ Other: _____

DETAILED ACTION

This action is in response to an amendment filed 6/24/08.

Information Disclosure Statement

1. The information disclosure statement (IDS) was submitted on 2/8/08. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement has been considered by the examiner.

Claim Objections

2. Claims 10-11 are objected to under 37 CFR 1.75(c) as being in improper form because a multiple dependent claim cannot depend on another multiple dependent claim. See MPEP § 608.01(n). Accordingly, the claims 10 and 11 not been further treated on the merits.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vincent et al. (U.S. 2002/0142579 A1; "Vincent").

5. Regarding claims 1-2, Vincent discloses a semiconductor device comprising an interlayer insulation film consisting of a fluoridation carbon film which contains an amount of hydrogen of between 0-60 atomic percent ([0030]-[0031]). Vincent does not specify that the amount of hydrogen atoms must be greater than 0 but less than 3

atomic percent. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select that the hydrogen contained in the film is in between 0-3 atomic percent, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

6. Regarding the limitations that the film "has been subjected to thermal history of 420°C or lower" and the hydrogen atoms in the film are "resulting from a chemical compound including hydrogen atoms as impurities", these are not given patentable weight because they attempt to define a product by its method of production (MPEP 2113).

7. Claims 6-7, 9, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirayama et al. (U.S. 6,884,365; "Hirayama").

8. Regarding claims 6-7, 9, and 14, Hirayama discloses a gas comprising an unsaturated carbon fluoride compound (octafluorocyclopentane) (col 8, lines 46-53), organic impurities, and moisture (can be assumed to be water because of further references to Karl Fischer measurements) (col 9, lines 8-18).

9. Hirayama does not disclose the following:

- a) The amount of the organic chemical compound including hydrogen is 10 weight ppm or less.
- b) The amount of water is 0.1 weight ppm or less.

10. Regarding (a), Hirayama discloses the presence of organic impurities (col 9, lines 14-18), which necessarily would contain hydrogen. Hirayama discloses the unsaturated carbon fluoride compound is 99.9% pure and discloses various amounts of trace constituents including moisture, oxygen and nitrogen gases (col 8, lines 46-53). Hence, one of ordinary skill in the art could determine the percentage by weight of organic impurities. While this is not specified as being less than 0.1 weight ppm or less, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select a concentration of organic impurities less than 0.1 weight ppm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

11. Regarding (b), Hirayama discloses that the amount of water is less than 20 weight ppm (col 8, lines 46-53). Hirayama does not disclose that the water must be less than 0.5 weight ppm. However, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select a water content of less than 0.5 weight ppm, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

12. Claims 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Robles et al. (U.S. 6,035,803; "Robles").

13. Regarding claim 12, Robles discloses a gas comprising an unsaturated carbon fluoride compound and hydrogen atoms supplied from a methane gas (col 12, lines 51-57). Furthermore, Robles discloses that the methane gas can be flowed into a reactor at a rate of 0 sccm (indicating methane entirely eliminated from the process) or up to 150 sccm, nearly the flow rate of the unsaturated carbon fluoride compound (col 12, lines 51-67). While Robles does not disclose that the hydrogen atoms, in this case from the methane, must be greater than 0 atomic percent but less than 1×10^{-3} atomic percent, it would have been obvious to one having ordinary skill in the art at the time the invention was made to select a flow rate to obtain a hydrogen concentration within 0 and 1×10^{-3} , exclusive, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

Allowable Subject Matter

14. Claims 3-5 are allowed. Claim 3 contains allowable subject matter because of the limitation of using a source gas of carbon and fluoride including hydrogen atoms in a concentration of 1×10^{-3} atomic percent or less to form a fluorocarbon film containing more than 0 atomic percent but less than 3 atomic percent hydrogen.
15. Claims 4-5 depend on claim 3.

Response to Arguments

16. Applicant's arguments with respect to claims 1-7, 9-12 and 14 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to **REEMA PATEL** whose telephone number is (571)270-1436. The examiner can normally be reached on M-F, 8:00-4:30 ET.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Charles Garber can be reached on (571)272-2194. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Reema Patel/
Examiner, Art Unit 2812
9/30/08

/Alexander G. Ghyka/
Primary Examiner, Art Unit 2812